SOW 140042
14 July 2014

STATEMENT OF WORK
FOR THE
PC-BASED OPEN ARCHITECTURE RECONFIGURABLE TRAINING SYSTEM (PORTS) MULTI-MISSION TACTICAL TRAINER (MMTT) (DEVICE 20F23) HARDWARE AND SOFTWARE UPGRADE

DEPARTMENT OF THE NAVY
NAVAL AIR WARFARE CENTER
TRAINING SYSTEMS DIVISION
12350 RESEARCH PARKWAY
ORLANDO, FL 32826-3275

APPROVED BY: _____ **DATE:** 7/21/2014
Mark Treadwell
Program Manager
AIR-1.3.6.1

APPROVED BY: _____ **DATE:** 21 July 2014
Daniel Chwalisz
Engineering Branch Head
AIR-4.6.8.3

APPROVED BY: _____ **DATE:** 7/21/2014
Charles Gifford
Navy Managed/International Logistics Branch Head
AIR-6.6.4.10

Table of Contents

Table of Contents

Table of Contents

Table of Contents

APPENDICES

TABLES

Statement of Work
For the
PORTS MMTT (Device 20F23) Hardware and Software Upgrade

1. SCOPE

This Statement of Work (SOW) establishes the contractor tasks for the hardware and software upgrades to be made to the MMTT training system.

Using the existing MMTT 4.X baseline detailed design from a previous contract, this effort includes software and hardware development, integration, and test. MMTT is located at the following locations: Surface Warfare Officer School (SWOS), Newport, Rhode Island (RI); Fleet Anti-Submarine Warfare Training Center (FLEASWTRACEN), San Diego, California (CA); Tactical Training Group Pacific (TTGPAC), Pt. Loma, San Diego, CA; Center for Surface Combat Systems (CSCS) Detachment (Det) East, Norfolk, Virginia (VA); CSCS Unit Dam Neck, VA; CSCS Det, Mayport, Florida (FL); and CSCS Det, Pearl Harbor, Hawaii (HI). Non-Cog 2"O" locations include: CSCS Det, Yokosuka, Japan.

The tasks required in this SOW are within the scope of the PORTS ID/IQC SOW 100079. Each of the main requirement paragraphs in this SOW contains a reference to the paragraphs of the PORTS ID/IQC SOW 100079 that authorize the required task.

1.1 Definitions

The following definitions apply to this SOW.

1.1.1 Commercial Item

Per the Federal Acquisition Regulations, Part 2.101, "Commercial Item" means:

a. Any item, other than real property, that is of a type customarily used by the general public or by non-governmental entities for purposes other than governmental purposes, and--

(1) Has been sold, leased, or licensed to the general public; or,

(2) Has been offered for sale, lease, or license to the general public;

b. Any item that evolved from an item described in paragraph a. of this definition through advances in technology or performance and that is not yet available in the commercial marketplace, but will be available in the commercial marketplace in time to satisfy the delivery requirements under a Government solicitation;

c. Any item that would satisfy a criterion expressed in paragraphs a. or b. of this definition, but for--

(1) Modifications of a type customarily available in the commercial marketplace; or

(2) Minor modifications of a type not customarily available in the commercial marketplace made to meet Federal Government requirements. Minor modifications means modifications that do not significantly alter the non-governmental function or essential physical characteristics of an item or component, or change the purpose of a process. Factors to be considered in determining whether a modification is minor include the value and size of the modification and the comparative value and size of the final product. Dollar values and percentages may be used as guideposts, but are not conclusive evidence that a modification is minor;

d. Any combination of items meeting the requirements of paragraphs a., b., c., or e. of this definition that are of a type customarily combined and sold in combination to the general public;

e. Installation services, maintenance services, repair services, training services, and other services if--

(1) Such services are procured for support of an item referred to in paragraphs a., b., c., or d. of this definition, regardless of whether such services are provided by the same source or at the same time as the item; and

(2) The source of such services provides similar services contemporaneously to the general public under terms and conditions similar to those offered to the Federal Government;

f. Services of a type offered and sold competitively in substantial quantities in the commercial marketplace based on established catalog or market prices for specific tasks performed or specific outcomes to be achieved and under standard commercial terms and conditions. For purposes of these services--

(1) "Catalog price" means a price included in a catalog, price list, schedule, or other form that is regularly maintained by the manufacturer or vendor, is either published or otherwise available for inspection by customers, and states prices at which sales are currently, or were last, made to a significant number of buyers constituting the general public; and

(2) "Market prices" means current prices that are established in the course of ordinary trade between buyers and sellers free to bargain and that can be substantiated through competition or from sources independent of the offerors.

g. Any item, combination of items, or service referred to in paragraphs a. through f. of this definition, notwithstanding the fact that the item, combination of items, or service is transferred between or among separate divisions, subsidiaries, or affiliates of a contractor; or

h. A Non-Developmental Item, if the procuring agency determines the item was developed exclusively at private expense and sold in substantial quantities, on a competitive basis, to multiple State and local governments.

1.1.2 Non-Developmental Item (NDI)

Per the Federal Acquisition Regulations, Part 2.101, NDI means:

a. Any previously developed item of supply used exclusively for governmental purposes by a Federal agency, a State or local government, or a foreign government with which the United States has a mutual defense cooperation agreement;

b. Any item described in paragraph a. of this definition that requires only Minor modifications (see 1.1.1, c., (2)) or modifications of a type customarily available in the commercial marketplace in order to meet the requirements of the procuring department or agency; or

c. Any item of supply being produced that does not meet the requirements of paragraph a. or b., solely because the item is not yet in use.

1.1.3 Trainer-Peculiar Equipment (TPE)

The following types of equipment are defined as TPE:

a. Trainer equipment which has not been classified by the Government as a Commercial Item, Government-Furnished Equipment (GFE), NDI, or Contractor Acquired Operational Equipment (CAOE).

b. Commercial Item, NDI, GFE, or CAOE, that:

(1) Needs other than Minor Modifications (see 1.1.1, c., (2)) or modifications which are not of a type customarily available in the commercial marketplace to meet the requirements of the contract, or:

(2) Does not have sufficient existing product documentation for Government logistic support.

1.2 Acronyms

Acronyms used in this SOW are defined in Appendix B.

2. APPLICABLE DOCUMENTS

The following documents of the issue listed form a part of this SOW to the extent specified herein. In the event of a conflict between documents referenced herein and the contents of this SOW, the contents of this SOW take precedence. Nothing in this SOW, however, supersedes applicable laws and regulations, unless a specific exemption has been obtained.

2.1 Government Documents

SPECIFICATIONS:

Naval Air Systems Command (NAVAIR) Naval Air Warfare Center Training Systems Division (NAWCTSD)

PRF 140043	-	Specification for the PORTS MMTT (Device 20F23) Hardware and Software dated 24 April 2014

OTHER PUBLICATIONS:

Code of Federal Regulations (CFR)

22 CFR, Parts 120 - 130	-	Foreign Relations, Chapter I - Department of State, Subchapter M - International Traffic in Arms Regulations

(The above regulations are available at http://www.pmddtc.state.gov/regulations_laws/itar_official.html

DoD and Department of the Navy (DoN) Security and Information Assurance (IA) Instructions, Manuals, Policy Memos, and Guidance Documents

DODI 8500.2	-	Information Assurance (IA) Implementation dated 6 Feb 2003
DoD 5220.22-M	-	National Industrial Security Program Operating Manual, dated 28 Feb 2006
DODI 8510.01	-	DoD Information Assurance Certification and Accreditation Process (DIACAP), dated 28 Nov 2007
DON DIACAP Handbook (Unnumbered)	-	DoN DoD Information Assurance Certification And Accreditation Process (DIACAP) Handbook series , dated 15 Jul 2008

(The above IA documents are available at http://navair.navy.mil/nawctsd/Resources/Library/IA/Index.cfm. The NISPOM is available at http://www.dtic.mil/whs/directives/corres/pub1.html)

Federal Acquisition Regulations (FAR)

FAR 52.204-9	-	Personal Identity Verification of Contractor Personnel
FAR 52.222-54	-	Employment Eligibility Verification

(FAR Clauses are downloadable from http://farsite.hill.af.mil/vffara.htm)

NAWCTSD

PORTS ID/IQC SOW 100079	-	Statement of Work for the PORTS ID/IQC, dated 20 May 2011
TEMP 140044	-	Trainer Test and Evaluation Master Plan (TEMP) for the PORTS MMTT (Device 20F23) Hardware and Software Upgrade

United States (U.S.) Office of Personnel Management (OPM)

OPM Memorandum	-	Final Credentialing Standards for Issuing Personal Identity Verification Cards under HSPD-12, dated 31 July 2008

(The above document is downloadable from http://www.opm.gov/investigate/resources/final_credentialing_standards.pdf)

2.2 Non-Government Documents

INDUSTRY STANDARDS

American National Standards Institute (ANSI)/American Society for Quality (ASQ)

ANSI/ASQ Q9000-2005	-	Quality Management Systems - Fundamentals and Vocabulary
ANSI/ASQ Q9001-2008	-	Quality Management Systems - Requirements
ANSI/ASQ Q9004-2009	-	Quality Management Systems - Guidelines for Performance Improvements

(Copies of the above documents are available from www.ansi.org or Global Engineering Documents, 15 Inverness Way, East Englewood, CO 80112.)

ANSI/Institute of Electrical and Electronics Engineers (IEEE)

IEEE Std. 830-1998	-	IEEE Recommended Practice for Software Requirements Specifications
ANSI/IEEE Std 1008-1987	-	IEEE Standard for Software Unit Testing
IEEE Std 1233-1998 Edition (R2002)	-	IEEE Guide for Developing System Requirements Specifications
IEEE/EIA 12207.1-1997	-	Standard for Information Technology – Software Life Cycle Process – Life Cycle Data
IEEE Std 12207-2008, 2nd Edition	-	Systems and Software Engineering – Software life cycle processes
IEEE Std 15288-2008, 2nd Edition	-	Systems and Software Engineering – System Life Cycle Process

IEEE Std 15939-2008 - Adoption of ISO/IEC 15939:2007 - Systems and Software Engineering - Measurement Process

(Copies of this document are available from www.ieee.org or IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854-1331.)

International Organization for Standardization/International Electro-technical Commission (ISO/IEC)

ISO/IEC 27002:2005 - Information technology - Security techniques - Code of practice for information security management (Redesignation of ISO/IEC 17799:2005)

(Copies of this document are available from http://www.ansi.org)

3. REQUIREMENTS

3.1 General

3.1.1 Program Management

The contractor shall organize, coordinate, and control the program activities to ensure compliance with the contract requirements and the timely delivery of the required product and services. The contractor shall provide the necessary program management, systems engineering, design engineering, materials, services, equipment, facilities, testing, technical, logistics, manufacturing, and clerical support for the efforts described in this SOW and NAWCTSD Specification PRF 140043. The contractor shall measure, monitor, and assess the progress of the work performed and costs incurred under the contract. The contractor shall prepare the Contractor's Progress, Status, and Management Report in accordance with (IAW) the Contract Data Requirements List (CDRL). (Ref: PORTS ID/IQC SOW 100079, para. 3.1.4)

3.1.1.1 Technical and Management Work Planning

The contractor shall develop and maintain a plan to ensure compliance with the contract requirements and the timely delivery of the required products and services. The contractor shall identify and document events, accomplishments, and criteria pursuant to successful completion of the work efforts. The contractor shall refine and update the plan as changes occur.

3.1.1.2 Work Planning and Scheduling

The contractor shall develop, document, implement, control, and maintain an Integrated Master Schedule (IMS) that presents the contractor's and subcontractor's plans and schedules to meet the requirements of the contract. The contractor shall develop and document a tiered scheduling system based on the CWBS elements showing all program milestones and prerequisite events, conferences, reviews, data submittals, and deliveries. The contractor shall construct the IMS to ensure that the program milestones are met and to ensure that deliveries meet the requirements of the contract. The contractor shall prepare the Integrated Program Management Report (IPMR) (IMS) IAW the CDRL.

3.1.1.3 Integrated Product Teams (IPTs)

The contractor shall define, document, implement, and maintain an IPT structure for the duration of the contract. The purpose of an IPT is to bring together the functions that have a stake in the

performance of a product or process and concurrently make integrated decisions affecting that product or process. IPT membership will consist of multi-functional stakeholders working together with a product-oriented focus. Each IPT will be empowered to make critical life cycle decisions regarding each product or process within their purview. IPTs will be applied at various levels ranging from the overall structure of an organization to informal groups functioning across existing units. With Government input, the contractor shall define and document the composition, structure, roles, and responsibilities of each IPT. Each IPT will maintain a list of membership. Each IPT will consist of Government and contractor personnel and have Government and contractor co-chairs. Each IPT will publish an agenda before each meeting. Each IPT will record and maintain meeting minutes. IPT minutes will be shared among and between the other IPTs.

3.1.1.4 Risk Management

The purpose of the risk management process is to continuously identify, analyze, treat, and monitor the risks to the program. The contractor shall conduct risk management to systematically control the uncertainty to meet cost, schedule, and performance requirements. The contractor shall provide the Government visibility into the contractor's tools, assessment, mitigation, and control techniques. The contractor shall define, document, manage, and apply a risk management process IAW IEEE Std 12207-2008, section 6.3.4. The contractor shall participate in the Government Risk Working Group established for this program. The contractor shall report risk information, data, and analysis in the Contractor's Progress, Status, and Management Report (CPSMR) cited in 3.1.1 above.

3.1.1.5 Quality Management

The purpose of the quality management process is to assure that the products and implementations of the life cycle meet contractor quality objectives and Government requirements. The contractor shall define, document, manage, and apply a quality management process IAW IEEE Std 12207-2008, sections 6.2.5 and 7.2.3; and ANSI/ASQ Q9001-2008 (or equivalent quality management system). The contractor may use ANSI/ASQ Q9000-2005 and ANSI/ASQ Q9004-2009 for guidance.

3.1.1.5.1 Control of Government-Furnished Equipment

The contractor shall perform the following tasks to control GFE as part of the quality management process:

a. Examine upon receipt, consistent with practicality, to detect damage
b. Provide storage that precludes deterioration
c. Examine prior to installation, consistent with practicality, to detect damage
d. Identify and protect from improper use or disposition
e. Verify and audit quantity periodically

3.1.1.5.2 Use of Contractor's Inspection Equipment

The contractor shall make measuring and testing devices available for use by the Government when required to determine conformance with contract requirements. The contractor shall provide the personnel needed to operate such devices and to verify calibration, accuracy, and condition.

3.1.1.6 Configuration Management Program

The purpose of the CM process is to maintain the integrity of identified Configuration Items (CIs) over their lifecycle. The contractor shall manage and apply a CM process IAW IEEE Std 12207-2008, section 6.3.5 and 7.2.2; and PORTS ID/IQC SOW 100079. The contractor shall place Government-Furnished Software (GFS), NDI, and Commercial Item software, and each item's associated documentation under CM upon receipt. The contractor shall place Commercial Item software items under CM as "disk image" files of the physical media. The contractor shall provide the Government with accessibility and visibility to the contractor's CM tools, assessment, and control techniques. (Ref: PORTS ID/IQC SOW 100079, para. 3.3.15)

3.1.1.6.1 Change Management

The contractor shall define, document, manage, and apply a process to accomplish change management. The contractor shall use Engineering Change Proposals (ECPs) and Request for Deviations (RFDs) to request changes to an approved baseline. The contractor shall prepare the Engineering Change Proposal (ECP) and the Request for Deviation (RFD) IAW the CDRL.

3.1.1.6.2 Configuration Audits

The contractor shall define, document, manage, and apply a process to accomplish configuration audits. The contractor shall conduct and participate in the FCA and PCA as specified in 3.2.8.9.3.1 and 3.2.8.9.3.2.

3.1.1.6.3 Configuration Status Accounting

The contractor shall define, document, manage, and apply a process to accomplish configuration status accounting. The contractor shall identify and document all items incorporated into or deleted from the trainer during development and modification. The contractor shall prepare the Technical Directive (TD) (Training Equipment Change Directive (TECD)) IAW the CDRL.

3.1.1.7 Data Management

The contractor shall develop, manage, and deliver acceptable contractually required data. Procedures and policies shall be established to provide control and configuration management of all contractually required data during the life of the contract. To ensure that subcontractor provided data meets the contract requirements, control of such data shall be maintained by the prime contractor. The contractor shall use the latest state-of-the-art media available within the contractor's organization for the development and storage of data deliverables. Data management systems shall be the subject of Government In-Process Reviews (IPRs) to determine if the data management requirements are being met.

3.1.1.8 Information Management

The purpose of the information management process is to provide relevant, timely, complete, and valid information to designated parties during the program life cycle. The contractor shall define, document, manage, and apply an information management process IAW IEEE Std 12207-2008, section 6.3.6 and 7.2.1. The contractor shall include the status of technical data deliveries in the CPSMR cited above in 3.1.1.

3.1.1.8.1 Infoshare Website

The contractor will be provided access to a secure NAWCTSD Infoshare Website to post and retrieve contract-related documents, data, and information. The NAWCTSD Infoshare Website meets current Federal Government, Navy, and NAWCTSD Information Assurance standards. The contractor shall contact the NAWCTSD Infoshare point of contact listed in the contract to coordinate access to the NAWCTSD Infoshare Website. The contractor shall notify the Government team via email when new or changed contract-related documents, data, and information are posted in the NAWCTSD Infoshare Website. Only unclassified data shall be posted in the NAWCTSD Infoshare Website.

3.1.1.8.2 Government-Industry Data Exchange Program (GIDEP)

The contractor shall maintain procedures to enable participation in the GIDEP. If not a participant already, the contractor shall contact the GIDEP Help Desk by calling (951) 898-3207 within 30 days after contract award to obtain the guidance necessary to become a GIDEP participant. The mailing address is GIDEP Operations Center, P.O. Box 8000, Corona CA 92878-8000. Compliance with this requirement shall not relieve the contractor from complying with other provisions of the contract. The contractor shall insert this requirement in subcontracts hereunder exceeding $500,000. When so inserted, the word "contractor" shall be changed to "subcontractor."

3.1.1.9 Program Measurement

The purpose of the measurement process is to collect, analyze, track, and report data relating to the products developed and the processes implemented within the program, to support the effective management of the processes, and to objectively demonstrate the quality of the products. The contractor shall define, document, manage and apply a process to collect, analyze, track, and report a balanced and diverse set of measures and metrics IAW IEEE Std 12207-2008, section 6.3.7 and IEEE Std 15939-2008. Program related measures and metrics shall reflect schedule, cost, quality, staffing, product stability, requirements volatility, and complexity information. Software specific measures and metrics related to schedule, quality, staffing, build stability, size, requirements volatility, and resource utilization shall be incorporated into the overall measurement process. The contractor shall collect and analyze the measures and metrics no less than once per month for the duration of the contract. Measures and metrics data shall be tracked and analyzed over time to report trends. The contractor shall define acceptable bounding criteria associated with each metric. The contractor shall define and implement a corrective action process that takes effect when a metric deviates from the acceptable bounding criteria. Metrics data, analysis, and reporting shall be available via the NAWCTSD Infoshare Website (see 3.1.1.8.1) and presented at the formal reviews and audits. The contractor shall report metrics data and analysis in the CPSMR cited above in 3.1.1.

3.1.2 Security (Classified Programs)

The contractor shall safeguard classified information and meet the security requirements identified in the DD Form 254. The contractor shall enforce these safeguards throughout the life of the contract including the transport and delivery phases. (Ref: Basic IQC PORTS ID/IQC SOW 100079, para. 3.1.8)

3.1.2.1 Operations Security (OPSEC)

The contractor shall provide OPSEC protection for classified information and sensitive information. Security policy, procedures, and requirements for classified information are provided in DoD 5220.22-M. The contractor shall enforce these safeguards throughout the life of the contract including the development, delivery, support phases, and the disposition/storage of classified and controlled unclassified information at contract completion. If the contractor does not have an established security plan that addresses the protection of proprietary, sensitive, or controlled unclassified information, the Government will provide a template for the development of an OPSEC Plan. Regardless of the contractor's established security plan, the contractor shall comply with the requirements specified in the following subordinate paragraphs.

3.1.2.2 Personnel Security - Background Check (Physical Access to and Working on DoD Installations)

The Common Access Card (CAC) shall be the principal identity credential for supporting interoperable access to DoD installations, facilities, buildings, controlled spaces, and access to U.S. Government information systems IAW FAR 52.204-9. A National Agency Check with Local Agency Checks including Credit Check (NACLC) shall be required for permanent issuance of the credential. There shall be no additional NACLC submission for an individual holding a valid national security clearance. The Government may issue the credential upon favorable return of the Federal Bureau of Investigations (FBI) fingerprint check, pending final favorable completion of the NACLC. Contractors with clearances shall contact the NAWCTSD Security Office to initiate the CAC issuance process. Access to restricted areas, controlled unclassified information (sensitive information), or Government Information Technology by contractor personnel shall be limited to those individuals who have been determined trustworthy as a result of the favorable completion of a NACLC or who are under the escort of appropriately cleared personnel. Where escorting such persons is not feasible, a NACLC shall be conducted and favorably reviewed by the appropriate DoD component, agency, or activity prior to permitting such access. For contractor personnel performing sensitive duties including access to controlled unclassified information, but do not have a clearance to access classified information, the contractor shall use the Standard Form 86 (Questionnaire for National Security Positions) in order to obtain the CAC. The contractor shall submit the Standard Form 86 to the NAWCTSD Security Office for processing. Contractors shall contact the NAWCTSD Security Office to initiate the CAC issuance process.

3.1.2.3 Personnel Security – Background Checks

Contractor personnel working at Government sites and in the contractor's own facilities supporting Government work shall undergo the company internal vetting process prior to gaining access to U.S. Government controlled unclassified information, or performing government-related sensitive duties. To comply with immigration law, the contractor shall use the Employment Eligibility Verification Program (E-Verify) IAW FAR 52.222-54. The contractor shall ensure that foreign persons, as defined under section 120.16 of the International Traffic and Arms Regulation (ITAR) (22 CFR, Parts 120 - 130), are not given access to U.S. Government controlled unclassified information, sensitive information, defense articles, defense services, or technical data, as defined in the ITAR, Part 120.

3.1.2.4 Information Assurance and Personnel Security Requirements for Accessing Government Information Technology (IT) Systems - Credentialing Standards

The contractor shall comply with the IA and personnel security requirements for accessing U.S. Government IT systems specified in the contract. Contractors requiring access to U.S. Government IT systems shall be subject to a background check. The contractor shall review and become familiar with the credentialing standards presented in OPM Memorandum for Issuing Personal Identity Verification Cards to use as an aid in their employee selection process. The NAWCTSD Security Office will apply the credentialing standards and execute the credentialing process for individual contractors.

3.1.2.4.1 Government-Issued Personal Identification Credentials

The contractor and subcontractor(s) (when applicable) shall account for all forms of U.S Government-provided identification credentials (CAC or U.S. Government-issued identification badges) issued to the contractor (or their employees in connection with performance) under the contract. The contractor shall return such identification credentials to the issuing agency at the earliest of the circumstances listed below, unless otherwise determined by the U.S. Government. The contracting officer may delay final payment under the contract, if the contractor or subcontractor fails to comply with these requirements.

a. When no longer needed for contract performance.
b. Upon completion of the contractor employee's employment.
c. Upon contract completion or termination.

3.1.2.5 Unclassified Contractor-Owned Network Security

The contractor shall take means (defense-in-depth measures) necessary to protect the confidentiality, integrity, and availability of Government controlled unclassified information. The contractor shall manage and maintain contractor-owned unclassified IT network assets (including computer assets used for contractor Teleworkers) used to process U.S. Government controlled unclassified information (sensitive information) IAW commercial best practices, vendor-specific, or other nationally or internationally-recognized IT configuration and management standards (e.g., Center for Internet Security (CIS), Control Objectives for Information and related Technology (COBIT®), Common Criteria, National Information Assurance Program (NIAP), DoD, Defense Information Systems Agency (DISA), International Computer Security Association (ICSA), National Industrial Security Program (NISP), National Security Agency (NSA), System Administration, Networking, and Security Institute (SANS), and ISO/IEC 27002:2005). The contractor shall prevent U.S. Government controlled unclassified information from being placed or stored on peer-to-peer applications or social media applications on contractor owned networks, including computer assets provided to contractors in a Teleworker status. The contractor shall manage and control networks (which contain U.S. Government controlled unclassified information) serving in a Continuity of Operations (COOP) capacity to meet the same personnel and security requirements identified in this SOW and the DD-Form-254.

3.1.2.6 Information Security Requirements for Protection of Unclassified DoD Information On Non-DoD Systems

The contractor shall safeguard unclassified DoD information stored on non-DoD information systems to prevent the loss, misuse, and unauthorized access to or update of this information. The contractor shall:

a. Not process DoD information on public computers (e.g., those available for use by the general public in kiosks or hotel business centers) or computers that do not have access control.

b. Protect information by no less than one physical or electronic barrier (e.g., locked container or room, login and password) when not under direct individual control.

c. Sanitize media (e.g., overwrite) before external release or disposal.

d. Encrypt the information that has been identified as Controlled Unclassified Information (CUI) when it is stored on mobile computing devices such as laptops and personal digital assistants, or removable storage media such as compact disks, using the best available encryption technology.

e. Limit information transfer to subcontractors or teaming partners with a need to know and a commitment to at least the same level of protection.

f. Transmit e-mail, text messages, and similar communications using technology and processes that provide the best level of privacy available, given facilities, conditions, and environment. Examples of recommended technologies or processes include closed networks, virtual private networks, public key-enabled encryption, and Transport Layer Security (TLS).

g. Encrypt organizational wireless connections and use encrypted wireless connection, where available, when traveling. When encrypted wireless is not available, encrypt application files (e.g., spreadsheet and word processing files), using no less than application-provided password protection level encryption.

h. Transmit voice and fax transmissions only when there is a reasonable assurance that access is limited to authorized recipients.

i. Not post DoD information to Web site pages that are publicly available or have access limited only by domain or Internet protocol restriction. Such information may be posted to Web site pages that control access by user identification or password, user certificates, or other technical means and provide protection via use of TLS or other equivalent technologies. Access control may be provided by the intranet (vice the Web site itself or the application it hosts).

j. Provide protection against computer network intrusions and data exfiltration, including no less than the following:

(1) Current and regularly updated malware protection services, e.g., anti-virus, anti-spyware.

(2) Monitoring and control of inbound and outbound network traffic (e.g., at the external boundary, sub-networks, individual hosts) including blocking unauthorized ingress, egress, and exfiltration through technologies such as firewalls and router policies, intrusion prevention or detection services, and host-based security services.

(3) Prompt application of security-relevant software patches, service packs, and hot fixes.

k. Comply with other current Federal and DoD information protection and reporting requirements for specified categories of information (e.g., critical program information,

Personally Identifiable Information (PII), export controlled information) IAW the requirements of the contract.

3.1.3 Information Assurance

The contractor shall design, develop, document, integrate, verify, and deliver a security architecture for the training device that satisfies the System IA controls as defined in DODI 8500.2 for a Mission Assurance Category (MAC) III, Classified device, and meets the IA performance requirements specified in NAWCTSD Specification PRF 140043. (Ref: PORTS ID/IQC SOW 100079, para. 3.1.9).

3.1.3.1 IA Certification and Accreditation Support

The contractor shall support the IA certification process IAW DODI 8510.01 and the implementing guidance contained in the DON DIACAP Handbook. The contractor shall prepare the Scientific and Technical Reports (DIACAP Certification and Accreditation (C&A) Package) IAW the CDRL.

3.1.3.2 IA Software Integrity Testing and Certification

The contractor shall test and certify that the training application software functions as designed in a properly secured operating system environment and is free of elements that might be detrimental to the secure operation of the resource operating system, as described in DODI 8500.2. The contractor shall provide Vendor Integrity Statements (VIS) for contractor-developed software applications. Commercial Item (see 1.1.1) software does not require a VIS. The contractor shall prepare the Scientific and Technical Reports (VIS for Software) IAW the CDRL.

3.1.3.3 IA Compliance

The contractor shall test, verify, and document that the security architecture and configuration of the training device are in compliance with the security requirements and IA controls identified in DODI 8500.2 for a MAC III, Classified system. The contractor shall use DoD-authorized assessment tools to perform IA testing (e.g. Retina, DISA Security Content Automation Protocol (SCAP) Tool), document, verify, and validate each applicable operating system IA configuration. Prior to testing, the Government will provide a list of assessment tools that the Government intends to use during testing. The contractor shall document the IA compliance results in the DIACAP C&A Package cited above in 3.1.3.1. The contractor shall work with NAWCTSD during coordination efforts with the Designated Accrediting Authority to support NAWCTSD in obtaining a system Authorization to Operate (ATO) concurrent with delivery of the training device hardware and software.

3.1.3.4 IA Vulnerability Management Program (IAVMP)

The contractor shall incorporate the applicable DoD and DoN IAVMP messages issued through Combined Government-Contractor Final Inspection (CGCFI). The contractor shall document the unincorporated IA Vulnerability Alerts (IAVAs), IA Vulnerability Bulletins (IAVBs), and IA Vulnerability Technical Advisories (IAVTAs). The contractor shall provide justification for each unincorporated IAVMP message (i.e., describe the specific negative impact the IAVMP message incorporation would have on trainer operation). The contractor shall document the information resulting from this task in the DIACAP C&A Package cited above in 3.1.3.1.

3.1.4 Travel

The contractor shall perform necessary travel in order to meet the requirements of this Delivery Order (DO). The contractor shall document and report the project related travel. The contractor shall include the details of each trip as part of the CPSMR cited above in 3.1.1. (Ref: PORTS ID/IQC SOW 100079, para. 3.1.5)

3.1.5 Over and Above (O&A)

The contractor shall provide the services necessary to perform O&A actions per the appropriate contract line item in order to resolve trainer development and trainer testing issues that were previously unquantifiable or unanticipated in nature at the time of contract award. Services shall be limited to the contractual requirements detailed in this SOW. (Ref: PORTS ID/IQC SOW 100079, para. 3.1.12)

3.1.6 Delivery and Installation

3.1.6.1 MMTT Hardware Upgrade

The contractor shall deliver the training system hardware for the MMTT tech refresh that meets the requirements as specified in this SOW and NAWCTSD Specification PRF 140043 to all MMTT trainer sites. (Ref: PORTS ID/IQC SOW 100079, para. 3.2.5)

3.1.6.2 MMTT TECR Software Upgrade

The contractor shall deliver the training system software for the MMTT TECR updates that meets the requirements as specified in this SOW and NAWCTSD Specification PRF 140043 to all MMTT trainer sites. (Ref: PORTS ID/IQC SOW 100079, para. 3.2.5)

3.2 Detailed Tasks

3.2.1 MMTT Hardware Upgrade

The contractor shall develop, procure, integrate, deliver, validate, and test the MMTT hardware upgrade specified in Appendix A and in NAWCTSD Specification PRF 140043. (Ref: PORTS ID/IQC SOW 100079, para. 3.1.13.11, 3.3.1.2) The Hardware upgrade shall include the following tasks:

a. Design, Develop, and Procure MMTT upgrade hardware

b. Assemble an operational MMTT trainer network configuration complete with device IP addresses, by site, in plant for all testing.

c. Install/validate the current MMTT software baseline

d. Install site specific software (i.e. TAO ITS, KMDV)

e. Install site specific support programs (i.e. Net Support School)

f. Deliver and install MMTT hardware upgrade to each site

g. Removal and disposal of unwanted existing hardware at each MMTT site. (i.e. DD149, transportation, packaging)

3.2.2 MMTT TECR Development

The contractor shall develop, integrate, deliver, validate, and test MMTT TECR updates specified in Appendix A and in NAWCTSD Specification PRF 140043. (Ref: PORTS ID/IQC SOW 100079, para. 3.1.13.11, 3.3.1.2)

3.2.3 Systems Engineering Processes

The contractor shall use the system engineering processes to define the requirements for the system, to transform the requirements into an effective product, and to verify and validate the functionality of the delivered product. The contractor shall perform the following tasks. (Ref: PORTS ID/IQC SOW 100079, para. 3.3.2)

3.2.3.1 System Requirements Definition

The purpose of the system requirements definition process is to define the requirements for a system that can provide the performance defined in this SOW and NAWCTSD Specification PRF 140043. The contractor shall define, document, manage, and apply a requirements definition process IAW IEEE Std 12207-2008, section 6.4.1.

3.2.3.2 System Requirements Analysis

The purpose of the system requirements analysis process is to transform the requirements of this SOW and NAWCTSD Specification PRF 140043 into a set of measureable and testable system requirements that specify characteristics of the system. The contractor shall define, document, manage, and apply a requirements analysis process IAW IEEE Std 12207-2008, section 6.4.2; and IEEE Std 1233-1998 Edition (R2002). The contractor shall analyze the NAWCTSD Specification PRF 140043 and SOW requirements to determine lower level functional requirements. The contractor shall analyze the requirements and decompose lower level functional requirements. The contractor shall analyze the interaction between systems, subsystems, and components to derive the functional requirements. The contractor shall decompose and derive requirements IAW the criteria within IEEE Std 1233-1998 Edition (R2002), sections 6.1 and 6.2. The contractor shall record NAWCTSD Specification PRF 140043 requirements, technical SOW requirements, and contractor decomposed and derived requirements within the Requirements Traceability/Verification Matrix (RTVM).

3.2.3.3 Traceability

The contractor shall define, document, manage, and apply a process and mechanism to accomplish traceability between the requirements, allocated design baseline, implementation configuration items, and test procedures IAW IEEE/EIA 12207.1-1997, section 6.17.3(i). The contractor shall utilize an electronic tool (e.g. Doors, RequisitePro, Access Database, and Excel Spreadsheet) to accomplish the requirement traceability function. Traceability shall be bi-directional. Backward traceability shall permit each RTVM element to explicitly trace to a source reference from a previous stage of development. Forward traceability shall permit each RTVM element to explicitly trace to a reference in a later stage of development. The contractor shall provide the Government access to the traceability tool and its database. The contractor shall prepare the Scientific and Technical Reports (RTVM) IAW the CDRL.

3.2.3.4 System Architectural Design

The purpose of the system architectural design process is to identify which system requirements should be allocated to which segments (subsystems) of the system. The contractor shall define, document, manage, and apply a system architectural design process IAW IEEE Std 12207-2008, section 6.4.3. The contractor shall place links to the system architectural design in the RTVM to accomplish bi-directional traceability.

3.2.3.5 Software Requirements Analysis

The purpose of the software requirements analysis process is to establish the requirements of the software elements of the training application. The contractor shall define, document, manage, and apply software requirements analysis IAW IEEE Std 12207-2008, section 7.1.2. The contractor shall analyze and define software requirements IAW the criteria within IEEE Std. 830-1998. The contractor shall place links to the software requirements in the RTVM to accomplish bi-directional traceability. The contractor shall prepare the Scientific and Technical Reports (Software Requirements Specification (SRS)) IAW the CDRL.

3.2.3.5.1 Software Requirements Verification

The contractor shall perform software requirements verification IAW IEEE Std 12207-2008, section 7.2.4.3.2.1.

3.2.3.6 Software Architectural Design

The purpose of the software architectural design process is to provide a design for the software that implements, and can be verified against, the requirements. The contractor shall define, document, control, maintain, and implement a software architectural design IAW IEEE Std 12207-2008, section 7.1.3. The contractor shall place links to the software architectural design in the RTVM to accomplish bi-directional traceability.

3.2.3.6.1 Software Architectural Design Verification

The contractor shall perform software architectural design verification IAW IEEE Std 12207-2008, section 7.2.4.3.2.2.

3.2.3.7 Software Detailed Design

The purpose of the software detailed design process is to provide a design for the software that implements, can be verified against the requirements and the software architecture, and is sufficiently detailed to permit coding and testing. The contractor shall define, document, control, maintain, and implement software detailed design IAW IEEE Std 12207-2008, section 7.1.4. The contractor shall place links to the software detailed design in the RTVM to accomplish traceability. The contractor shall prepare the Scientific and Technical Reports (Software Design Description (SDD)) IAW the CDRL.

3.2.3.7.1 Software Detailed Design Verification

The contractor shall perform software detailed design verification IAW IEEE Std 12207-2008, section 7.2.4.3.2.2.

3.2.3.7.2 Programming High Order Language(s) (HOL) Selection

The contractor shall determine, through a formal process, the HOL(s) for use in the training system. The contractor shall consider development tools, portability, maintainability, and overall life cycle cost in making the selection(s). The contractor shall not utilize platform specific language extensions without Government-authorization.

3.2.3.8 Implementation

The purpose of the implementation process is to produce a specified system element. The contractor shall define, document, control, maintain, and perform implementation IAW IEEE Std 15288-2008, section 6.4.4.

3.2.3.8.1 Software Implementation

The purpose of the software implementation process is to produce a specified system element that is implemented as a software product or service. The contractor shall define, document, control, maintain, and perform software implementation IAW IEEE Std 12207-2008, section 7.1.1.

3.2.3.8.1.1 Software Unit Construction and Testing

The purpose of the software construction process is to produce both source code and executable software units that properly reflect the software design. The contractor shall define, document, control, maintain, and implement software construction IAW IEEE Std 12207-2008, section 7.1.5. The contractor shall accomplish software unit testing IAW ANSI/IEEE Std 1008-1987.

3.2.3.8.1.1.1 Software Code Verification

The contractor shall perform software code verification IAW IEEE Std 12207-2008, section 7.2.4.3.2.3.

3.2.3.8.2 Software Integration

The contractor shall define, document, control, maintain, and implement software integration IAW IEEE Std 12207-2008, section 7.1.6.

3.2.3.8.3 Software Integration Verification

The contractor shall perform software integration verification IAW IEEE Std 12207-2008, section 7.2.4.3.2.4.

3.2.3.8.3.1 Software Qualification Testing

The purpose of the software qualification testing process is to confirm that the integrated software product meets its defined requirements. The contractor shall define, document, control, maintain, and implement software qualification testing IAW IEEE Std 12207-2008, section 7.1.7.

3.2.3.9 System Integration

The purpose of the system integration process is to assemble a complete system that is consistent with the system architectural design. The contractor shall define, document, manage, and apply a system integration process IAW IEEE Std 12207-2008, section 6.4.5.

3.2.3.10 System Qualification Testing

The purpose of the system qualification testing process is to ensure that the implementation of each system requirement is tested for compliance and the system is ready for delivery. The contractor shall define, document, manage, and apply a system verification process IAW IEEE Std 12207-2008, section 6.4.6. The contractor shall place links to the system test procedures in the RTVM to accomplish bi-directional traceability.

3.2.3.11 Device Transition

The purpose of the device transition process is to install the verified system, together with enabling systems. The contractor shall define, document, manage, and apply a system transition and installation process IAW IEEE Std 15288-2008, section 6.4.7.

3.2.3.11.1 Software Installation

The purpose of the software installation process is to install the software product that meets the requirements in the target environment. The contractor shall define, document, control, maintain, validate, and implement software installation IAW IEEE Std 12207-2008, section 6.4.7.

3.2.3.11.2 Software Product

The contractor shall define, document, control, maintain, validate, and prepare the trainer software IAW IEEE/EIA 12207.1-1997, sections 6.7, 6.13, and 6.24. The contractor shall deliver the software, and databases required to meet the performance defined in this SOW and NAWCTSD Specification PRF 140043. The contractor shall deliver the non-Commercial Item software with corresponding source code, build tools, executable code, configuration information, and build procedures. The contractor shall deliver the Commercial Item software with the associated vendor manuals, documentation, physical media, warranty information, licenses, and installation procedures. The contractor shall transfer to the Government at device acceptance, the Commercial Item software licenses. The contractor shall prepare the Scientific and Technical Reports (Software Product Specification (SPS)) IAW the CDRL.

3.2.3.11.2.1 Cold Start Procedures

The contractor shall develop, document, control, maintain, validate and prepare, computational subsystem cold start procedures IAW IEEE/EIA 12207.1-1997, sections 6.7 and 6.13, and NAWCTSD Specification PRF 140043. The contractor shall prepare a cold start procedure for each computational subsystem that is delivered with associated software source code. The contractor shall prepare a cold start procedure for each computational subsystem that is composed of contractor acquired discrete components (e.g. computer hardware, operating system, and application software), which are then integrated by the contractor. The contractor shall not use a disk image to accomplish a cold-start. The contractor shall develop cold start procedures:

a. For configuring applicable computer hardware settings such as in a Basic Input/Output System (BIOS) or firmware

b. For installing and configuring each operating system, to include user accounts, network connectivity, device drivers, and IA controls

c. For installing and configuring each software application

d. For installing the deliverable source code

e. For performing a software build(s) where executable program(s) are created from deliverable source code

f. For introducing Government-authorized source code changes; where the existing software build is removed and a new build is created

g. That consist of detailed descriptive action to be performed; the expected result following the action; and an area to document abnormalities, discrepancies, errors, and pass/fail status

h. That ensure that complex sequences of cold-start actions are broken down into discrete steps

i. That can be accomplished without referring to external documentation

j. That include listing the physical software media required to perform the cold-start

k. That include Commercial Item software activation data, such as serial numbers and key codes

3.2.3.11.2.2 Installation and Configuration Procedures

The contractor shall develop, document, control, maintain, validate, and prepare the installation and configuration procedures IAW IEEE/EIA 12207.1-1997, sections 6.7 and 6.13, and NAWCTSD Specification PRF 140043. The contractor shall prepare installation and configuration procedures for each computational subsystem acquired as a tightly integrated, ready to use turnkey system. Turnkey describes a Commercial Item that is pre-built, in which everything needed is put together by a vendor and sold as a bundle. Examples of turnkey subsystems could include Commercial Item control loaders, aural cueing, and image generators. The contractor shall develop installation and configuration procedures:

a. For configuring applicable computer hardware settings such as in a BIOS or firmware

b. For restoring the system software, such as the operating system, applications and data, to the original delivered configuration.

c. For configuring the system software for use within the training device, such as user accounts, network connectivity, and information assurance controls

d. That consist of detailed descriptive action to be performed; the expected result following the action; and an area to document abnormalities, discrepancies, errors, and pass/fail status

e. That ensure that complex sequences of installation and configuration actions are broken down into discrete steps

f. That can be accomplished without referring to external documentation

g. That include listing the physical software media required to perform the installation and configuration procedure

h. That include Commercial Item software activation data, such as serial numbers and key codes

3.2.3.11.2.3 Media and Storage Devices

The contractor shall provide to the Government the blank media and mass storage devices necessary to perform each subsystem cold start and installation procedure. The Government will retain custody and control of the media and storage devices created or used by the Government to accomplish testing. The contractor shall provide the additional media and mass storage

devices necessary for the contractor's internal archiving, development, testing, and other engineering and Configuration Management (CM) purposes.

3.2.3.11.2.4 Cold Start and Installation Procedure Media

The contractor shall prepare a unique set of physical media for each computational subsystem. The contractor shall prepare the physical media required to perform each subsystem cold-start procedure with labeling that:

a. Is formatted consistently
b. Is permanently attached to the physical media
c. Identifies the software vendor name
d. Identifies the software product name
e. Identifies the software version number
f. Identifies the software release date
g. Identifies the contractor's Configuration Control identifier
h. Identifies the total number of media pieces that compose each configured item
i. Identifies the individual piece number within a multiple piece item, such as "Disk 2 of 5" or "DVD 1 of 3"

3.2.3.11.2.5 Automated Processes

The contractor shall document, control, maintain, validate, and deliver all computational automated processes (e.g., scripts, batch files, job control language, kick-start, and slipstreamed media) in the same manner as software items.

3.2.3.11.2.6 Contractor Execution

Prior to the start of each Test Readiness Review (TRR), the contractor shall execute and validate each subsystem cold start and installation procedure. The contractor shall perform the entire cold start and installation procedure, step-by-step as written, and document the results of each step. The contractor shall present the results of each contractor-run cold start and installation procedure to the Government for review at the following TRR event. The contractor shall execute, document, correct and validate each cold start and installation procedure until no discrepancies exist.

3.2.3.12 System Validation

The purpose of the system validation process is to provide objective evidence that the performance of the installed system, when in use, meets the requirements of this SOW and NAWCTSD Specification PRF 140043. The contractor shall define, document, manage, and apply a system validation process IAW IEEE Std 15288-2008, section 6.4.8; and the system T&E requirements specified herein.

3.2.3.12.1 Software Acceptance Support

The purpose of the software acceptance support process is to assist the Government in achieving confidence that the software product meets the requirements. The contractor shall define, document, control, and implement software acceptance support IAW IEEE Std 12207-2008, section 6.4.8.

3.2.3.13 Human Factors Engineering (HFE)

The contractor shall integrate human factors into the trainer update design. Objectives shall include balance of system performance and cost of ownership by ensuring that the system design is compatible with the capabilities and limitations of the personnel who will operate and maintain the item. Cognitive HFE design decisions shall be reflected in the supporting instructional strategies and materials.

3.2.4 Conferences and Reviews

The contractor shall conduct, attend, and participate in conferences and reviews to be held at both the contractor and Government facilities. The specific locations, dates, and duration of the conferences shall be as specified in the contract. Conferences and reviews will be chaired by a Government representative. The contractor shall be prepared to explain the reasoning, assumption, and methodologies in arriving at particular conclusions, recommendations, or alternatives in the accomplishment of the tasks required by the contract. The contractor shall prepare drawings and other data to aid in the presentations. The contractor shall have key personnel and support available to carry out the conference. The contractor shall make available facilities for Government only meetings during the conferences and reviews. Subcontractors shall attend conferences and reviews when required to address key elements. The contractor shall prepare the Conference Agenda, Conference Minutes, and Presentation Material for the conferences and reviews IAW the CDRLs. Except where noted herein, conferences and reviews shall be considered fulfilled when the following items are completed: (Ref: PORTS ID/IQC SOW 100079, para. 3.3.4)

a. A formal meeting has been conducted and the conference and reviews are presented to the Government.
b. Topics required for discussion and presentation have been covered.
c. Action items requiring contractor response have been resolved.
d. The Government has accepted the conference minutes.

3.2.4.1 Post Award Conference (PAC)

The first conference will be the PAC. The purpose of the conference shall be to establish the framework of the contractor and Government interaction during the performance period of the contract. At the PAC, the contractor shall present an IMS showing the critical milestones and supporting events, including logistics, leading to these milestones. The PAC shall include the presentation and discussion of information and data relating to:

a. Introduction and contract overview
b. Discussion and clarification of Spec and SOW requirements
c. Presentation of a complete, accurate, and realistic IMS and detailed schedule with status
d. Identification of the critical paths within the IMS and detailed schedule
e. CDRL delivery schedule and status
f. Technical Documentation Overview
g. Program specific Systems Engineering Management Plan (SEMP)
h. Program specific TEMP
i. Program specific CM Plan (to include Data Management)
j. Program specific Software Development Plan (SDP)

k. Program specific Quality Assurance Management Plan (QAMP) (to include Software QA)

l. Program specific Risk Management Plan (RMP)

m. Program specific OPSEC and IA implementation plans

n. Program life cycle model selection and rationale

o. IPT structure, membership, and responsibilities

p. Action item reporting and status

q. Updated team contact list (names, IPT memberships, phone numbers, and email addresses)

r. Metrics collection process, analysis, and reporting

3.2.4.1.1 PAC Entry Criteria

Entry criteria for the PAC shall consist of Government concurrence with the following:

a. The contractor-submitted PAC agenda is complete and acceptable.

b. The contractor has completed the program specific SEMP, CM Plan, SDP, QAMP, RMP, and OPSEC plan.

3.2.4.1.2 PAC Exit Criteria

Exit criteria for the PAC shall consist of Government concurrence with the following:

a. Required PAC topics have been presented, discussed, and documented.

b. IMS and detailed schedule are complete, accurate, and realistic.

c. IPT structure, membership, and responsibilities are satisfactorily defined, documented, and implemented.

d. The contractor has documented and started implementation of the program specific SEMP, TEMP, CM Plan, SDP, QAMP, RMP, and OPSEC plan.

e. PAC minutes and presentation materials have been submitted and accepted.

f. Action items have been assigned with suspense date for closure.

3.2.4.2 Systems Engineering Technical Reviews (SETR)

The contractor shall conduct and participate in SETR events chaired and attended by the Government. The SETRs shall not be a place for problem solving, but to verify that problem solving has been accomplished. Each SETR will be chaired and led by a Technical Review Board (TRB) Chairperson that is independent to the program team. The SETR shall be event driven vice schedule driven and are scheduled when the required system baseline has achieved a level of maturity for the intended review. Any results from the SETR shall not eliminate the contractor's responsibility to meet contract requirements. Regardless of Government interaction in the design review process, the contractor shall maintain design responsibility for the system.

3.2.4.2.1 System Requirements Review-System Functional Review (SRR-SFR)

The contractor shall conduct a combined SRR-SFR. The SRR-SFR is a multi-disciplined product and process assessment to ensure that the system modifications under review can proceed into preliminary design, and that the system functional requirements, including derived and decomposed requirements, are defined and consistent with program cost, schedule, risk, and other system constraints. The SRR-SFR shall assess the system functional requirements and

ensure that the required system performance is fully defined and is traceable to the functional baseline (NAWCTSD Specification PRF 140043). At the SRR-SFR, the contractor shall:

a. Identify and discuss resource availability to support the schedule
b. Present and discuss a schedule critical path
c. Provide current status vs. critical path
d. Describe implementation of the SDP
e. Provide a complete program organizational structure
f. Identify relevant contractor Subject Matter Experts (SMEs) to be used during development and testing
g. Show that the functional requirements are traceable to the system requirements
h. Show that the explicit and derived requirements are quantified and documented
i. Address the following applicable functional areas:
    (1) T&E
    (2) Technical Data
    (3) Quality management
    (4) CM
j. Present the results of a comprehensive risk assessment for design, integration, and test

3.2.4.2.1.1 SRR-SFR Entry Criteria

Entry criteria for the SRR-SFR shall consist of Government concurrence with the following:

a. PAC exit criteria have been met.
b. Delivery and acceptance (when applicable), IAW CDRL requirements, of all the CDRL items scheduled to be delivered prior to SRR-SFR.
c. Contractor submitted SRR-SFR agenda is complete and acceptable.
d. All PAC action items requiring contractor response have been completed and closed.
e. Availability of RTVM showing traceability of requirements IAW 3.2.3.3.
f. IMS is resourced at reasonable levels with realistic performance expectations.
g. Program technical risks identified.
h. Program execution risks identified.

3.2.4.2.1.2 SRR-SFR Exit Criteria

Exit criteria for SRR-SFR shall consist of Government determination of acceptable risk in all the SRR-SFR elements listed above, and Government concurrence with the following:

a. All SRR-SFR issues were captured in Requests for Action (RFAs) and properly adjudicated and assigned.
b. All SRR-SFR RFAs were completed (closed).
c. The required technical areas were represented at the review.
d. The RTVM demonstrates forward and backward traceability between requirements, associated design documentation, and Test Procedure (TP), as required in 3.2.3.3.
e. Functional requirements, as disclosed, satisfy the training needs.
f. System functional definition and functional decomposition is detailed enough to support preliminary detailed design.

g. System Functional Baseline has been established to enable preliminary design to proceed under CM.

h. Processes and metrics are in place.

i. Risks are known and are manageable for implementation of the functional requirements into a preliminary design.

j. Program schedule is executable within the anticipated cost and technical risks.

k. Program is properly staffed.

l. SRR-SFR presentation materials are available.

m. SRR-SFR minutes have been submitted and accepted.

3.2.4.2.2 Preliminary Design Review (PDR)

The contractor shall conduct a PDR. The purpose of the PDR is for the Government to formally review the activities and work products generated by the contractor during the performance of the preliminary design stage in order to develop the allocated baseline, and to verify that the approach for the system modification design is ready to proceed into the detailed design phase. The contractor shall present and describe the training system modification design and program status, and address the design changes made to the preliminary design proposed in the proposal. The following items shall be topics of discussion and presentation at the PDR:

a. Training system modification hardware and software design, including:
    (1) Computational system
    (2) Visual system
    (3) Instructional system
    (4) Software tools
    (5) Trainer databases
    (6) Software development files
    (7) Hardware and software interfaces
    (8) Design modularity and commonality

b. T&E

c. Program problem and risk areas, recommended solutions, and evaluation of alternatives

d. Updated RTVM

3.2.4.2.2.1 PDR Entry Criteria

Entry criteria for the PDR shall consist of Government concurrence with the following:

a. SRR-SFR exit criteria have been met

b. CDRL items scheduled to be delivered prior to PDR have been delivered and accepted (when applicable) IAW CDRL requirements.

c. Updated RTVM showing traceability of requirements IAW 3.2.3.3 is available.

d. Allocated baseline has been developed.

e. Risk assessments and risk mitigation plans have been developed.

f. IMS shows critical path through Critical Design Review (CDR).

g. Program technical risk is manageable and mitigation options are acceptable.

h. Program execution risk is manageable and mitigation options are acceptable.

i. PDR agenda has been submitted and accepted.

3.2.4.2.2.2 PDR Exit Criteria

Exit criteria and final acceptance of the PDR shall consist of Government concurrence with the following:

a. CDRL items that were part of the PDR entry criteria have been satisfactorily discussed.

b. The updated RTVM demonstrates forward and backward traceability, as required in 3.2.3.3.

c. Risk assessments and risk mitigation plans have been satisfactorily discussed. Risks and their respective mitigation plans are in place and manageable for implementation of the functional requirements into a preliminary design.

d. Program schedule is executable within the anticipated cost and technical risks.

e. Program is properly staffed.

f. PDR action items have been successfully resolved and closed.

g. PDR presentation materials are available.

h. Per the IMS, an executable schedule has been presented.

i. PDR minutes have been submitted and accepted.

j. Allocated baseline has been established.

3.2.4.2.3 Critical Design Review

The contractor shall conduct a CDR. The purpose of the CDR is for the Government to formally review the activities and work products generated by the contractor during the performance of the critical design stage in order to develop the product baseline, and to verify that the system modifications are ready to proceed into the hardware-software coding, assembly, and integration phase. The contractor shall present and describe the finalized training system modifications' design and program status, and address the design changes made since the PDR. The following items shall be topics of discussion and presentation at the CDR:

a. Training system modification hardware and software design, including:
    (1) Computational system
    (2) Visual system
    (3) Instructional system
    (4) Software tools
    (5) Trainer databases
    (6) Software development files
    (7) Hardware and software interfaces
    (8) Design modularity and commonality

b. T&E

c. Program problem and risk areas, recommended solutions, and evaluation of alternatives

d. Updated RTVM

3.2.4.2.3.1 CDR Entry Criteria

Entry criteria for the CDR shall consist of Government concurrence with the following:

a. PDR exit criteria have been met.

b. CDRL items scheduled to be delivered prior to CDR have been delivered and accepted (when applicable) IAW CDRL requirements.

c. Updated RTVM showing requirements traceability, as required in 3.2.3.3 is available.

d. Product baseline has been developed.

e. Updated risk assessment and risk mitigation plans are available.

f. Risks and their respective mitigation plans are in place and manageable for implementation of the functional requirements into a final design.

g. Trade-off analyses have been completed.

h. Logistics analysis has been completed and plans have been established.

i. Facility planning has been completed.

j. IMS shows critical path through testing.

k. CDR agenda has been submitted and accepted.

3.2.4.2.3.2 CDR Exit Criteria

Exit criteria and final acceptance of the CDR shall consist of Government concurrence with the following:

a. CDRL items that were part of the CDR entry criteria have been satisfactorily discussed.

b. The updated RTVM demonstrates forward and backward traceability, as required in 3.2.3.3.

c. Updated risk assessments and risk mitigation plans have been satisfactorily discussed. Risks and their respective mitigation plans are in place and manageable for implementation of the functional requirements into a final design.

d. Program schedule is executable within the anticipated cost and technical risks.

e. Program is properly staffed.

f. CDR action items have been successfully resolved and closed.

g. CDR presentation materials are available.

h. Per the IMS, an executable schedule has been presented

i. CDR minutes have been submitted and accepted.

j. Product baseline has been established.

3.2.4.3 TRR Conferences

TRRs shall be conducted IAW the T&E program requirements (see 3.2.8.9.2 and 3.2.8.9.3.1.2) and Appendix A. The purpose of the TRRs is to determine the modified trainer's readiness for Government testing.

3.2.4.4 IPT Meetings

The contractor shall attend and participate in IPT meetings to be conducted throughout the entire contract. IPT meetings shall provide a forum suitable for maintaining a continuous interchange of ideas, issues, and to identify and resolve potential problem areas. IPT meetings shall be documented in the conference minutes.

3.2.4.5 In-Process Reviews

The contractor shall conduct IPRs. IPRs shall provide attendees with information regarding the status and planned activities of the program. IPRs shall include the following:

a. A presentation on the status of the overall program, including the training system update design (software), Quality Management, CM, and testing.
b. Review of software status
c. Review of the program schedule status
d. Review of program risks
e. Review of updated RTVM

3.2.5 Commercial and Non-Developmental Items (CaNDI)

The contractor shall fulfill the requirements of the contract through acquisition of CaNDI to the maximum extent practicable. CaNDI proposed by the contractor will be reviewed by the Government to determine whether each proposed CaNDI component is, in fact, CaNDI. The Government will also determine the extent to which the proposed CaNDI is practicable for off-the-shelf use within the Government's logistical environment. The Government Reserves the right to perform inspections and tests as deemed necessary to verify the practicability of items proposed as CaNDI for off-the-shelf use in the trainer updates. (Ref: PORTS ID/IQC SOW 100079, para. 3.3.10)

3.2.6 Product Assurance Audits and Inspections

The Government may perform audits and inspections of contractor conformance to contractual requirements, including product assurance programs such as reliability, maintainability, parts management, safety, Electrostatic Discharge (ESD) control, CM, and Quality Management System (QMS), at any time during the performance of the contract. The contractor shall make non-deliverable product assurance documentation and data available to the Government during these audits and inspections. The Government will provide notice to the contractor prior to conducting audits and inspections. (Ref: PORTS ID/IQC SOW 100079, para. 3.3.12)

3.2.7 System Test and Evaluation

The contractor shall plan, coordinate, establish, and implement a T&E program designed to verify that the modified trainer and the integration of the subsystems and equipment associated with the trainer updates meet the technical and operational requirements as stated in this SOW and NAWCTSD Specification PRF 140043. The contractor shall provide representation in the T&E working IPT (WIPT) and shall attend and participate in the T&E WIPT meetings. T&E WIPT will be the forum for discussion, coordination, and resolution of test planning goals, strategy, and issues. (Ref: PORTS ID/IQC SOW 100079, para. 3.3.13)

3.2.7.1 Responsibility for Tests

Unless otherwise specified herein, the contractor shall perform the specified test and inspections. The Government Reserves the right to perform tests and inspections that are deemed necessary to ensure that delivered supplies and services conform to the contract requirements.

3.2.7.2 Test Authority

The contractor shall record the test results during contractor's inspections. A Procuring Contracting Officer's (PCO's) representative will certify the contractor's test results. A PCO's representative will record the Government's inspection and test results.

3.2.7.3 T&E Program Planning

The contractor, working with the T&E WIPT, shall develop and document the structure and objectives of the T&E program for the trainer updates. The contractor shall continuously reassess and refine the T&E program as the trainer updates development, production, and testing progresses. A baseline preliminary Trainer T&E Master Plan (TEMP 140044), prepared by the Government, is provided as an attachment to the contract, and will be hereinafter referred to as the TEMP. The contractor shall update the TEMP throughout the contract to reflect changes in T&E concepts, test responsibilities, mission and systems descriptions, T&E ground rules, schedules, documentation, and resource requirements. TEMP review shall be an agenda item at each scheduled requirements, design, progress, and test readiness reviews. The contractor shall prepare the Revisions to Existing Government Documents (TEMP) IAW the CDRL.

3.2.7.4 Test Resources and Facilities

The contractor shall furnish the inspection and testing facilities, equipment, and personnel required to ensure that the modified trainer meets the requirements of NAWCTSD Specification PRF 140043 and the contract. The inspection and testing facilities shall provide the environmental conditions required by the tests specified herein. The contractor shall ensure that the contractor personnel, test equipment, test facilities, other supporting equipment, spare assemblies and parts, test and data logs, and other items necessary for testing are available for the start and during the required testing events.

3.2.8 MMTT System Test and Evaluation

3.2.8.1 Test Methods

Tests shall be performed IAW the Government-accepted TP document and other Government-accepted test plans as documented in the TEMP. Test, examination, demonstration, inspection, and verification procedures shall be documented in the TP. The test methods and procedures shall be written so that a qualified technician can perform the tests. The system cold start procedures, developed IAW 3.2.3.11.2.1, shall be included as part of the TP. The TP shall include the tests, examinations, demonstrations, inspections, and verifications specified in NAWCTSD Specification PRF 140043.When two or more quantitative readings are required simultaneously, the test method shall provide an automated means for data collection to the maximum extent practicable. The cases where this automated data collection is not practicable shall be authorized by the T&E WIPT and documented in the TEMP. No calculations, extrapolations, or other mathematical processing shall be required, or allowed, as part of an ongoing test to arrive at the expected results, unless authorized by the T&E WIPT and documented in the TEMP. Test results shall be documented in the Test/Inspection Report. The contractor shall prepare the TP and Test/Inspection Report IAW the CDRLs.

3.2.8.2 Test Criteria

The test criteria for tests and examinations shall include both quantitative and qualitative performance data of the operational system(s). Quantitative test criteria shall be used to the maximum extent possible. Qualitative data such as video, photographs, and tape recordings, obtained from operational system or subsystem performance, may be used as test criteria whenever quantitative test criteria is not practical or is not measurable, and the requirement for simulation or stimulation realism can only be judged qualitatively. Government approval is required for test criteria that are not based on actual operational system performance data. Where appropriate, test criteria for individual inspections, tests, demonstrations, and examinations shall consist of both quantitative and qualitative test criteria. As a complement to quantitative test results, qualitative comparisons of visual, video, and aural presentations shall be provided.

3.2.8.3 Tolerance Data

Test tolerances shall be identified for the test criteria. Test tolerances and the source from which the specified tolerances are derived shall be identified in the TP and Test/Inspection Report Specified tolerances shall be derived from the trainer specification, design criteria reports, manufacturing criteria, and operational equipment data.

3.2.8.4 Alignment

The contractor shall perform the necessary equipment alignments prior to the initiation of each increment of the T&E program.

3.2.8.5 Test Log

The contractor shall maintain a log of subsystem and system tests conducted in-plant and on-site. Entries into the test log shall begin with the start of contractor and subcontractor engineering verification testing and shall continue until the completion of testing. The test log shall show (by date) equipment adjustments, updates, failures, removal, replacements, and scheduled and unscheduled maintenance. The contractor shall make the test log available to the Government technical representative upon request.

3.2.8.6 Changes During Testing

Changes made in the alignment, programming, or adjustments during the T&E program, shall be recorded in the contractor's test log. Tests conducted prior to such changes shall be repeated, unless a Government technical representative determines that such changes have not invalidated the related test data.

3.2.8.6.1 Software Changes During Government Testing

Changes to software baselines during Government and combined Government-contractor test events shall require Government authorization. The Government will maintain configuration control of software baselines used during Government testing. The contractor shall demonstrate to the Government that proposed software baseline changes are supported by contractor regression testing.

3.2.8.7 Changes After Testing

Updates or changes in design, which are determined to be necessary as a result of testing, shall be recorded in the contractor's test log. Tests run prior to such updates shall be repeated unless a Government technical representative determines that such changes have not invalidated the related test data.

3.2.8.8 T&E Deficiency Reporting System

The contractor shall implement a deficiency reporting system for tracking (identification, assignment, status, progress, resolution) hardware and software problems (including tactical subsystem) discovered during the Conformance Inspections. In addition, the deficiency reporting system shall be used to track documentation problems including technical documentation and data errors. During Hardware-Software Integration (HSI) and early testing, the contractor shall utilize a Software/System Trouble Reports (STRs) system. The contractor's defined STR process is acceptable for deficiency reporting during HSI. The contractor shall provide the Government their definition for deficiencies, categories and priorities, and allow the Government to participate and have access to the contractor's STR tracking system. As the modified training system matures to system level testing, Government Deficiency Reports (DRs) shall be recorded and classified as Part I through Part III through the Deficiency Report Review Board (DRRB). The TEMP outlines suggested STR priorities and provides the Government definitions for DR categories and timing of corrections.

3.2.8.8.1 Deficiency Report Review Board

The DRRB membership shall include Government and contractor personnel. The DRRB members and processes shall be determined after contract award as part of the T&E WIPT meetings. The DRRB will review STRs and classify DRs.

3.2.8.9 PORTS MMTT T&E Program Components

The T&E program for the PORTS MMTT effort shall consist of the test phases described below. Test phases will be structured by the T&E WIPT to provide the testing required to support the verification of requirements. The T&E program shall consist of the following components:

a. Contractor Preliminary Inspection (CPI)
b. TRR-1
c. Conformance Inspections:
    (1) Functional Configuration Audit (FCA)
        (a) Government Preliminary Inspection (GPI)
        (b) TRR-2
        (c) CGCFI
    (2) Physical Configuration Audit (PCA)

3.2.8.9.1 Contractor Preliminary Inspection

The contractor shall perform CPI IAW the Government-accepted TP and other Government-accepted test plans as documented in the TEMP. The contractor shall conduct the tests incrementally under the direction of the contractor's Quality Management System (QMS) representative who shall certify by signature that the specific test(s) have been completed and the

documented results are correct and comply with the requirements of this SOW and NAWCTSD Specification PRF 140043. The CPI shall include a complete run of the Government-accepted TP from start to finish, including software cold start. Software cold-start shall begin with formatted but otherwise blank hard drives for both the development system and in-plant trainer test bed. A PCO representative may witness the performance of the CPI. The contractor shall document that the test procedures have been run start-to-finish as a complete test, without segregation of elements of individual tests, prior to TRR-1. The contractor shall annotate in the TP, procedural changes made as a result of the CPI and shall provide a copy of the annotated TP to the Government prior to the start of GPI. The contractor shall document the CPI results in the Test/Inspection Report. The contractor shall record tests results that do not comply with specification requirements as deficiencies. The contractor shall correct the deficiencies found during CPI prior to the commencement of GPI. The documented CPI results, including open deficiencies, shall be presented to the Government on an incremental basis at the next scheduled T&E WIPT meeting and in final total form at the TRR-1.

3.2.8.9.2 Test Readiness Review-1

TRR-1 will be conducted by the Government, following completion of CPI and after the TRR entry criteria specified below in 3.2.8.9.2.1 have been met. The purpose of the TRR-1 is to determine trainer readiness for GPI. The contractor shall provide the resources, including facilities, equipment, and personnel to support the TRR-1. The TRR-1 will include a review of the T&E program, including the test results, presentation of contractor certification of test readiness, and open deficiencies remaining from CPI. The contractor shall present a cross-reference matrix, in contractor's format, to verify that the requirements of 3.2.8 and NAWCTSD Specification PRF 140043 have been tested. The TRR-1 shall include a contractor-conducted, Government-witnessed demonstration of trainer stability for testing. The trainer stability demonstration shall consist of the performance of a stress test IAW the verification requirements of 3.2.8 and NAWCTSD Specification PRF 140043. The TRR-1 will be repeated until the trainer has been determined by the Government to be acceptable for commencement of the Conformance Inspections. During TRR-1, the following shall be reviewed and discussed:

a. Trainer test procedures
b. Updated RTVM to verify specification requirements have been tested
c. Recorded R&M data
d. The contractor's test log
e. CPI test results (including Software Items (SI) test results) and deficiencies
f. Test discrepancy reporting process and applicable test discrepancy report form to be used during GPI.
g. Identification of software test tools to be used during GPI
h. Summary of software problems status
i. Status of spare capacities, such as Central Processing Unit (CPU) (timing), memory capacity, and disk storage
j. Cold start procedures
k. Mission exercises

3.2.8.9.2.1 TRR-1 Entry Criteria

The entry criteria for TRR-1 shall consist of Government concurrence with the following:

a. All CPI tests have been run as evidenced by the existence of contractor test logs, TP execution entries, and related DR records.

b. There is documented evidence that demonstrates that a complete run of the Government-accepted TP has been accomplished from start to finish during CPI, without segregation of elements of individual tests.

c. The above documents and data are available prior to the start of the TRR-1.

3.2.8.9.2.2 TRR-1 Exit Criteria

The exit criteria for TRR-1 shall consist of Government concurrence with the following:

a. TEMP is available and has been established as the basis for all testing.

b. Contractor test logs and records demonstrate that a complete run of the TP has been executed, as evidenced by the following:

(1) Contractor has provided a copy of the updated tests results, with red-lines (when necessary), as recorded in the contractual test documentation. Each completed step has been initialed. Each completed page has been signed and dated by the contractor's test manager and QMS representative.

(2) Contractor has provided applicable personnel names and functions for team members involved in contractor testing.

(3) CPI deficiencies have been documented, categorized for severity, and tracked to final resolution (DR sign-off or corrective plan).

(4) Contractual CM processes have been followed, and contractor generated CM logs are available for Government review/inspection. Baseline configuration has been established.

(5) System stability has been demonstrated as acceptable for Government testing. System crashes have been recorded denoting cause of each crash and recovery time measured from system crash to resuming testing.

c. Contractor has demonstrated that the test equipment needed to execute the complete TP was used, functions properly, is in calibration, and is currently available and working.

d. Contractor's QMS representative has certified in writing that contractor testing has been completed and that the training application is ready for Government testing.

e. Agreed plan for Government testing has been established and TP has been accepted by the Government.

f. Contractor test personnel are available to work with the Government, when required, in the execution of Government tests.

g. TP red-lines have been incorporated and the testing documentation is ready for use and annotation of results.

h. DR database has been setup for tracking deficiencies.

3.2.8.9.3 Conformance Inspections

The Conformance Inspections shall be conducted at times and places specified in the contract and IAW the following paragraphs. The Conformance Inspections shall consist of an FCA performed to the extent specified herein.

3.2.8.9.3.1 Functional Configuration Audit

The FCA shall include the tests, assessments, inspections, demonstrations, and verifications specified in 3.2.8 and NAWCTSD Specification PRF 140043, and shall be performed to demonstrate that training system performance satisfies NAWCTSD Specification PRF 140043 requirements. The FCA tests shall be performed IAW the Government-accepted TP and other Government-accepted test plans as documented in the TEMP. The tests shall exercise the application at the subsystem, system, intersystem, and combined trainer system levels. The tests shall be designed to validate the simulation and stimulation performance throughout the entire performance envelope, in the specified configurations and modes of operation. The tests shall exercise the simulation and stimulation in the most complex and demanding computational configurations. Tests shall be conducted without alignment or adjustment of controls, other than the accessible controls employed for normal trainer operation. No repairs or adjustments, other than those authorized by the Government test director, will be permitted during the conduct of tests. If repairs or adjustments are required, the test in question, and other tests whose results may be affected thereby, shall be repeated after repairs or adjustments have been made. The FCA shall include tests developed to evaluate the integration of GFE and their interfaces with other trainer equipment. The FCA shall consist of a GPI performed to the extent specified below.

3.2.8.9.3.1.1 Government Preliminary Inspection

GPI shall commence upon notification by the representative of the PCO that the exit criteria for TRR-1 have been met. GPI will be conducted in-plant by the Government test team as defined in the TEMP. GPI will consist of Government-conducted tests to demonstrate compliance with the specified performance requirements. GPI shall be conducted IAW the Government-accepted TP (revised to include corrections made during CPI) and other Government-accepted test plans as documented in the TEMP. The contractor shall provide the Government with a copy of the revised TP prior to GPI. The Government Reserves the right to perform additional tests to ensure compliance with the specified requirements. Testing shall commence with the establishment of a software baseline resulting from a software cold-start performed IAW the cold start requirements specified in this SOW, the verification requirements of 3.2.8 and NAWCTSD Specification PRF 140043, and the Government-accepted TP. Software cold-start shall include the deletion of all existing hard drive partitions, the creation of new partitions, and the formatting of the hard drives for both the development system and in-plant trainer test bed. Following the cold-start, the Government will perform the IA verifications IAW the verification requirements of 3.1.3, NAWCTSD Specification PRF 140043, and the Government-accepted TP. Deficiency correction verification and validation, including additional cold-starts, will be at the discretion of the Government test team. The typical test schedule may consist of a 10-hour test day followed by the contractor's deficiency clean-up and system maintenance periods. The contractor shall provide the resources, personnel, equipment, and facilities to support the tests. Hardware and software CI testing and design documentation verification and validation will be conducted as an integral part of GPI. Deficiencies found during these tests shall be corrected by the contractor and verified by the Government test team prior to shipment of the training application to the installation site, unless otherwise authorized by the Government test director. Authorization to ship the application to the installation site will be contingent upon notification by the representative of the PCO that the GPI exit criteria specified below have been met.

3.2.8.9.3.1.1.1 GPI Exit Criteria

The exit criteria for GPI shall consist of Government concurrence with the following:

a. Cold start has been successfully performed to establish the application's software baseline configuration to be used for testing.

b. TP tests have been executed and signed off.

c. SME resources (Software, Hardware, Visual, and other required personnel) and test equipment necessary for remaining DR correction and follow-on testing have been identified by name.

d. A complete TP test or acceptable regression test series representative of the complete TP (as determined by the Government) has been run after the final DR ready for re-test. TP tests may be reduced within acceptable regression testing guidelines determined by the Government.

e. Updated tests results have been recorded in the contractual test documentation, including date/time of final results and red-lines (when necessary).

f. Deficiencies have been documented, categorized for severity, and tracked to final resolution (DR sign-off or corrective plan).

g. Part I*, Part I, and Part II deficiencies identified during GPI testing have been corrected, regression testing has been conducted, and required QMS standards have been satisfied/achieved.

h. System stability has been demonstrated as acceptable, as determine by the Government.

i. GPI has demonstrated that test equipment needed to execute the complete TP has been used, functions properly, and is currently available, calibrated, and working.

j. CM baseline (software and hardware) has been maintained throughout DR correction. CM deficiencies identified during GPI have been corrected.

3.2.8.9.3.1.2 Test Readiness Review-2

TRR-2 will be conducted by the Government, following completion of GPI and after the TRR-2 entry criteria specified below in 3.2.8.9.3.1.2.1 has been met. The purpose of the TRR-2 is to determine the trainer readiness for the CGCFI. The contractor shall provide the resources, including facilities, equipment, and personnel necessary to support the TRR-2. TRR-2 will include a review of the T&E program, including all test results, presentation of contractor certification of test readiness, and open deficiencies remaining from GPI. The contractor shall present a cross-reference matrix, in contractor's format, to verify that all 3.2.8 and NAWCTSD Specification PRF 140043 requirements have been tested. The TRR-2 shall include a contractor-conducted, Government-witnessed demonstration of trainer stability for testing. The trainer stability demonstration shall consist of the performance of a stress test IAW the verification requirements of 3.2.8 and NAWCTSD Specification PRF 140043. The TRR-2 shall be repeated until the application has been determined by the Government to be acceptable for commencement of the CGCFI. During the TRR-2, the following shall be reviewed and discussed:

a. Trainer test procedures

b. Updated RTVM to verify specification requirements have been tested

c. Contractor test log

d. GPI test results (including Software Item test results) and deficiencies

e. Test discrepancy reporting process and applicable test discrepancy report form to be used during CGCFI.

f. Identification of software test tools to be used during CGCFI

g. Summary of software problems status

h. Status of software timing and memory size

i. Status of spare memory

j. Cold start procedures

k. Mission exercises

3.2.8.9.3.1.2.1 TRR-2 Entry Criteria

The entry criteria for TRR-2 shall consist of Government concurrence with the following:

a. All GPI tests have been run as evidenced by the existence of contractor test logs, TP execution entries, and related DR records.

b. There is documented evidence that demonstrates that a complete run of the Government-accepted TP has been accomplished from start to finish during GPI, without segregation of elements of individual tests.

c. The above documents and data are available prior to the start of the TRR-2.

3.2.8.9.3.1.2.2 TRR-2 Exit Criteria

The exit criteria for TRR-2 shall consist of Government concurrence with the following:

a. TEMP is available and has been established as the basis for all testing.

b. Contractor test logs and records demonstrate that a complete run of the TP has been executed, as evidenced by the following:

(1) Contractor has provided a copy of the updated tests results, with red-lines (when necessary), as recorded in the contractual test documentation. Each completed step has been initialed. Each completed page has been signed and dated by the contractor's test manager and QMS representative.

(2) Contractor has provided applicable personnel names and functions for team members involved in contractor testing.

(3) GPI deficiencies have been documented, categorized for severity, and tracked to final resolution (DR sign-off or corrective plan).

(4) Contractual CM processes have been followed, and contractor generated CM logs are available for Government review/inspection. Baseline configuration has been established.

(5) System stability has been demonstrated as acceptable for Government testing. System crashes have been recorded denoting cause of each crash and recovery time measured from system crash to resuming testing.

c. Contractor has demonstrated that the test equipment needed to execute the complete TP was used, functions properly, is in calibration, and is currently available and working.

d. Contractor's QA representative has certified in writing that contractor testing has been completed and that the application is ready for CGCFI.

e. Agreed plan for Government testing has been established and TP has been accepted by the Government.

f. Contractor test personnel are available to work with the Government, when required, in the execution of testing during CGCFI.

g. TP red-lines have been incorporated and the testing documentation is ready for use and annotation of results.

h. DR database has been setup for tracking deficiencies.

3.2.8.9.3.1.3 Combined Government/Contractor Final Inspection

CGCFI shall commence upon notification by the representative of the PCO that the TRR-2 exit criteria have been met. CGCFI will be conducted in-plant by a combined contractor-Government test team as defined in the TEMP and will consist of tests conducted to verify compliance with the specified performance requirements. CGCFI shall be conducted IAW the Government-accepted TP (revised to include corrections made during CPI and GPI) and other Government-accepted test plans as documented in the TEMP. The contractor shall provide the Government with a copy of this revised TP prior to CGCFI. Testing shall commence with the establishment of a software baseline resulting from a software cold-start performed IAW the cold start requirements specified in this SOW, the verification requirements of 3.2.8, NAWCTSD Specification PRF 140043, and the Government-accepted TP. Cold-start shall begin with formatted but otherwise blank hard drives for both the development system and in-plant trainer test bed. Following the cold-start, the Government will perform the IA verifications IAW the verification requirements of 3.1.3, NAWCTSD Specification PRF 140043, and the Government-accepted TP. Deficiency correction verification and validation, including additional cold-starts, will be at the discretion of the Government. The typical test schedule may consist of a 10-hour test day followed by the contractor's deficiency clean-up and system maintenance periods. The contractor shall provide the resources, personnel, and equipment necessary to support the tests. Hardware and software CI testing and design documentation verification and validation will be conducted as an integral part of CGCFI. The Government Reserves the right to perform such additional tests as deemed necessary to ensure compliance with the specified requirements. Deficiencies found during CGCFI shall be corrected by the contractor and verified by the Government test team prior to Government acceptance of the training application.

3.2.8.9.3.1.3.1 CGCFI Exit Criteria

The exit criteria for CGCFI shall consist of Government concurrence with the following:

a. A cold-start has been successfully performed to establish final software baseline.

b. Deficiencies identified were documented, categorized for severity, and tracked to final resolution (DR sign-off and dismissal).

c. Part I*, I, II, and III deficiencies have been corrected.

d. A complete TP test has been run after the final DR ready for re-test, within acceptable regression testing guidelines as determined by the Government.

e. Government mission testing has been performed successfully.

f. A copy of the final TP test results has been provided with the results recorded in the contractual testing documentation, including date/time of final results, and red-lines (when necessary).

g. System stability has been demonstrated as acceptable, as determined by the Government.

h. CM baseline (software and hardware) has been maintained throughout DR correction. CM deficiencies identified during CGCFI have been corrected.

i. CGCFI has demonstrated that the test and support equipment necessary to execute the complete TP testing were used, documented, in calibration, and functioned properly.

j. Required QMS standards have been satisfied and achieved.

k. Contractor's QMS representative, contractor's test manager, and Government's test director have signed off testing as complete.

3.2.8.9.3.2 Physical Configuration Audit

The PCA shall consist of non-functional examinations performed IAW the Government-accepted TP to demonstrate that the training device as-built design satisfies NAWCTSD Specification PRF 140043 requirements, and that the deliverable hardware and software documentation accurately reflect the configuration items. The contractor shall perform a planning effort for the PCA and document the results in the TEMP. The contractor shall develop and document in the TP, the test procedures to perform the PCA examinations. The contractor shall record the results of the PCA examinations in the Test/Inspection Report. Non-deliverable documents may be in contractor format and will be examined only to determine contractor compliance with CM requirements. The PCA will be conducted by a Government team on the as-built trainer with power off. The contractor shall certify, prior to the start of PCA examinations, that the electrical power, including Uninterruptible Power Supply (UPS) systems, have been disconnected, and that the trainer has been de-energized. The contractor shall provide the personnel, equipment, and facilities necessary to support the Government-conducted examinations. The contractor shall be responsible for the disassembly of the trainer equipment and for providing access to areas of the training equipment not normally accessible. The Government Reserves the right to perform other examinations deemed necessary to determine compliance with NAWCTSD Specification PRF 140043 and design documentation requirements. The contractor shall prepare the Configuration Audit Summary Report IAW the CDRL. The PCA shall commence upon successful completion of the FCA in order to establish the product baseline prior to training application acceptance, as indicated by a signed DD-250. The PCA shall consist of software and hardware examinations defined in selected sections of the Government-accepted TP and other Government-accepted test plans, as documented in the TEMP. The hardware PCA will consist of an examination of the as-built trainer against its design documentation and the software PCA shall consist of an examination of the as-built version of the computer system configuration items against the software technical documentation. Deficiencies recorded by the Government shall be corrected by the contractor prior to the signing of the DD-250. The PCA shall be conducted on-site at some time (mutually agreed) following successful completion of the FCA and before acceptance of the training system.

3.2.9 Integrated Logistic Support Requirements

The contractor shall perform the following logistic support tasks. (PORTS ID/IQC SOW 100079, para. 3.3.14).

3.2.9.1 Inventory Management

The contractor shall establish and maintain accurate records of all deliverable equipment, software, documentation, support items, repair parts, and other items that are delivered as part of

or with the training application for inventory control. Prior to delivery of the training application, the contractor shall develop Equipment Inventory Records (EIRs) to support delivery and verification of the training application. The contractor shall prepare the EIRs IAW the CDRL.

3.2.9.2 Buy Through the Prime (BTTP)

The contractor shall order, receive, inspect, test, store, package, and deliver system hardware to support the training device. Provisioned items shall include vendor manufactured items that are non-national stock numbered items, as of the date of the delivery order. Items to be delivered shall be the same as, interchangeable with, or meet the form, fit, and function requirements of the items included in the delivered system and other deliverable hardware. These items shall be configured identically to like items of the training device.

3.2.9.3 System Hardware Warranties

The contractor shall turn over to the Government all warranties, guarantees, and services remaining in effect at the delivery of the training device. When authorized by the Government, the contractor shall procure five year extended warranties for system hardware. The contractor shall notify the Government before purchasing hardware warranties of availability and pricing. The contractor shall identify the equipment and delineate the warranties, guarantees, and service due the Navy upon the Navy taking possession of the equipment. The contractor shall mark the warranted hardware IAW NAWTSD Specification PRF 140043. The contractor shall prepare the Warranty Performance Report IAW the CDRL.

3.2.10 Technical & Training Documentation (TD)

The contractor shall provide technical documentation that supports effective Instructor/Operator utilization and maintenance concept for the trainer. All hardware or software of the trainer relating the function, interface, operation, or maintenance shall be addressed. The contractor shall prepare the Systems Interface Manual (SIM) Appendix IAW the CDRL. (Ref: PORTS ID/IQC SOW 100079, para. 3.3.17)

Appendix A

Requirements Application

TABLE A-I. PORTS MMTT Requirements Application

Task/CLIN	Award Status	Applicable Data Item	Applicable SOW Section #'s	Applicable SPEC Section #'s
MMTT TECH REFRESH CLIN 0001	Priced Option	All Data Items Apply	Section 1 and subsections Section 2 and subsections Section 3 and subsections	Section 1 and subsections Section 2 and subsections Section 3 and subsections Section 4 and subsections Section 5 and subsections Section 6 and subsections Appendix C
MMTT TECR UPDATES CLIN 0002	Priced Option	Test Procedures Test/Inspection Report TEMP PORTS DIACAP Package RTVM SRS SDD SPS VIS IMS SIM All Administrative Data Items No Logistics Data Items	Section 1 and subsections Section 2 and subsections Section 3 all apply except 3.1.6.1, 3.2.1, 3.2.8.9.3.2, 3.2.9, 3.2.10	Section 1 and subsections Section 2 and subsections Section 3 through 3.1.3.1, 3.1.9.2, 3.2 Section 4 and subsections Section 5 and subsections Section 6 and subsections Appendix B

Appendix B

Acronyms List

Applicable Acronyms

The following acronyms are applicable to this SOW:

Acronym	Definition
ANSI	American National Standards Institute
ASQ	American Society for Quality Control
ATO	Authority To Operate
BIOS	Basic Input/Output System
C&A	Certification and Accreditation
CAC	Common Access Card
CaNDI	Commercial and Non-Developmental Items
CDR	Critical Design Review
CDRL	Contract Data Requirements List
CI	Configuration Item
CIS	Center for Internet Security
CM	Configuration Management
CFR	Code of Federal Regulations
CGCFI	Combined Government/Contractor Final Inspection
COBIT	Control Objectives for Information and related Technology
COOP	Continuity of Operations
CPI	Contractor Preliminary Inspection
CPSMR	Contractor's Progress, Status and Management Report
CPU	Central Processing Unit
CUI	Controlled Unclassified Information
CWBS	Contract Work Breakdown Structure
DFARS	Defense Federal Acquisition Regulations Supplement
DIACAP	DoD Information Assurance Certification and Accreditation Process
DISA	Defense Information Systems Agency
DO	Delivery Order
DOD	Department of Defense
DON	Department of the Navy
DR	Deficiency Report
DRRB	Deficiency Report Review Board
ECP	Engineering Change Proposal
EIA	Electronic Industries Alliance
FAR	Federal Acquisition Regulations
FBI	Federal Bureau of Investigation

Appendix B

Acronym	Definition
FCA	Functional Configuration Audit
FPT	Fleet Project Team
GFE	Government Furnished Equipment
GFS	Government Furnished Software
GIDEP	Government/Industry Data Exchange Program
GPI	Government Preliminary Inspection
GRTS	Generic Reconfigurable Training System
HFE	Human Factors Engineering
HOL	High Order Language
HSI	Hardware-Software Integration
IA	Information Assurance
IAVA	Information Assurance Vulnerability Alert
IAVB	Information Assurance Vulnerability Bulletin
IAVMP	Information Assurance Vulnerability Management Program
IAVTA	Information Assurance Vulnerability Technical Advisories
IAW	In Accordance With
ICSA	International Computer Security Association
ID/IQC	Indefinite Delivery/Indefinite Quantities Contract
IEC	International Electro-technical Commission
IEEE	Institute of Electrical and Electronics Engineers
IMS	Integrated Master Schedule
IPMR	Integrated Program Management Report
IPR	In-Process Review
IPT	Integrated Project Team
ISO	International Organization for Standardization
IT	Information Technology
ITAR	International Traffic and Arms Regulations
ITS	Intelligent Tutoring System
KMDV	K
LTF	Littoral Training Facility
MAC	Mission Assurance Category
MCM	Mine Counter Measure
MMTT	Multi-Mission Tactical Trainer
MPTS	Mission Package Training System
MWTC	Marine Warfare Training Center
NACLC	National Agency Check with Local Agency Checks
NAVAIR	Naval Air Systems Command
NAWCTSD	Naval Air Warfare Center Training Systems Division
NDI	Non-Developmental Item

Appendix B

Acronym	Definition
NIAP	National Information Assurance Partnership
NIST	National Institute of Standards & Technology
NSA	National Security Agency
O&A	Over and Above
OPM	Office of Personnel Management
OPSEC	Operations Security
PAC	Post Award Conference
PCO	Procuring Contracting Officer
PII	Personally Identifiable Information
PORTS	PC Based Open Architecture Reconfigurable Training System
QAMP	Quality Assurance and Management Plan
QMS	Quality Management System
RFA	Request For Action
RFD	Request For Deviation
RI	Rhode Island
RMP	Risk Management Plan
RTVM	Requirements Traceability Matrix
SANS	System Administration, Networking, and Security Institute
SCAP	Security Content Automation Protocol
SDD	Software Design Description
SDP	Software Development Plan
SEMP	Systems Engineering Management Plan
SFR	Systems Functional Review
SETR	Systems Engineering Technical Review
SI	Software Item
SME	Subject Matter Expert
SOW	Statement of Work
SPS	Software Product Specification
SRR	System Requirements Review
SRS	System Requirements Specification
STR	Software Trouble Report
SWOS	Surface Warfare Officers School
TAO	Tactical Action Officer
T&E	Test and Evaluation
TECR	Training Equipment Change Request
TIM	Technical Interchange Meeting
TLS	Transport Layer Security
TP	Test Procedures
TRR	Test Readiness Review
TEMP	Trainer Test & Evaluation Master Plan

Appendix B

Acronym	Definition
U.S.	United States
VIS	Vendor Integrity Statement
VRS	Voice Recognition System
WAWF	Wide Area Workflow